

Pathogenetic Treatment of Gonarthrosis Using Autogenic Growth Factors

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Abstract: In 25% of cases, therapy leads to the development of unwanted drug reactions, and in 5% of patients it can be life-threatening. Long-term use of NSAIDs often exacerbates the course. To reduce the dose or completely cancel NSAIDs, chondroprotectors, glucosamine and chondroitin sulfate, are included in the complex therapy of OA. With the ineffectiveness of NSAIDs and local forms of OA, intra-articular injections of hyaluronic acid preparations are justified. They are able to stimulate the production of endogenous HA, have anti-inflammatory, regenerative and chondroprotective effects. Stimulation of the production of endogenous HA can also be achieved by intra-articular administration of the patient's autoplasm enriched with platelets (AutoPRP). Platelet autogenous growth factors, in particular, transforming growth factor beta TGF- β , can achieve suppression of destruction processes in the joint [1.3.5.7.9.11].

Keywords: Treatment, drug, Gonarthrosis.

When using the affected tissues, an increased concentration of platelet anabolic cytokines, plasma factors and 6 adhesive molecules is achieved, which allows stimulating their regeneration. A large number of scientific and clinical studies have been devoted to increasing the effectiveness of conservative treatment of patients with OA using AutoPRP. However, the issue of choosing criteria for prescribing a specific therapy regimen to a particular patient, the volume and duration of the course of treatment still retains the status of a scientific discussion and requires clarification and verification by clinical practice [2.4.6.8.10.12].

The purpose of the study is an approach to the selection of pathogenetic therapy regimens for patients with gonarthrosis, including the use of autologous platelet growth factors.

Efficacy of therapy for patients with gonarthrosis with additional inclusion in the standard treatment regimen of intra-articular administration of AutoBoTP and the combination of AutoBoTP with hyaluronic acid preparations, which resulted in a decrease in the intensity of pain, improvement in the function of the 8th knee joint, normalization of the surface tension and viscosity of the synovial fluid, normalization of the content in it calcium ions and phosphate ions. The probability coefficients of changes in the indicators of the clinical and biochemical status of patients with gonarthrosis in dynamics were calculated depending on the initial individual severity of these characteristics and different treatment regimens, which made it possible to develop and apply a differentiated approach to choosing a treatment regimen for a particular patient [13.15.17.19.21.23.25.27].

Research methods. studying and summarizing the data of publications devoted to the treatment of patients with osteoarthritis of the knee joint using conservative therapy regimens, assessing the degree of development and relevance of the topic. In accordance with the goal and objectives, a plan was developed for the implementation of all stages of the dissertation work; selected objects and a set of modern research methods. The objects of the study were patients with gonarthrosis stage 2-3. The study was conducted in groups formed using stratified randomization. In the process of work, clinical, biochemical, statistical research methods were used. Mathematical data processing was carried out using relevant methods of statistical analysis of biomedical data [14.16.18.20.22].

The study, in addition to the procedures for assessing the level of ESR, leukocytosis, and C-reactive protein level declared by the standard, included several more markers that make it possible to more accurately assess the state of the joint during the initial treatment and the effectiveness of therapeutic measures. In particular, we investigated the level of viscosity and surface tension of the synovial fluid, the content of calcium ions (Ca^{2+}), phosphates (PO_4^{3-}) and the ratio in it. As shown in the literature review, the most significant in terms of clinical diagnosis is the ratio. For an objective assessment of the severity of pain due to the presence of inflammatory reactions in the knee joint, the parameters of blood and synovial fluid were studied using laboratory and clinical tests [24.26.28.30.32].

At the initial examination for selection into the study groups, differences were observed with probability only for the level of C-reactive protein in blood plasma. Prior to the start of therapy, its lowest value of 4.68 Mg/l was noted in patients selected for the standard treatment group in combination. In the group formed to receive only standard therapy, the indicator was 5.14 Mg / l, and in the group with the hyaluronic acid preparation, the value of the indicator before the start of treatment was. All other laboratory markers used in our study had no statistically significant differences in pre-treatment scores in all three groups.

The question is to evaluate the comparative effectiveness of the most commonly used pathology therapy regimens. As part of fulfilling the requirements of the job description, it can be difficult for a practical doctor to take into account all the subtleties of the therapeutic effects of each of the drugs approved for the treatment of gonarthrosis, especially to evaluate the effect of their combinations in a comparative aspect. In this case, the results of research work, which scrupulously assesses all the nuances of the initial state of patients, the dynamics of each of the symptoms and individual indicators that characterize the process of restoring the functional activity of the knee joint during treatment, can provide significant assistance to clinicians. The first chapter of our study provides information on individual therapeutic effects of the drugs used in the work and their combinations. The objectives of the study included a comparative assessment of the effectiveness of treatment regimens using a different set of pharmacotherapeutic agents from the treatment standards for deforming osteoarthritis of the knee, as well as treatment regimens with the inclusion of hyaluronic acid preparations in addition to the AutoboTP standard [33.35.37.39].

The dynamics of the level of objective quantitative indicators confirms the conclusions of the previous section of the chapter on the effectiveness rating of the used treatment regimens. The level of inflammation markers decreased most significantly compared to the level before treatment in patients of the third group when using a combination of standard therapy, AutoPRP and a hyaluronic acid preparation: ESR by 23%, the value of C-reactive protein decreased by the same amount - 23%. Whereas in the first and second groups, these parameters decreased less pronouncedly, respectively: ESR - 13% and 15%, C-reactive protein - 7% and 12%. Synovial fluid in patients of the third group increased by 27% 6 weeks after the end of the course of treatment, and in the second group by 21%, while in patients of the first group it increased by 17%. The surface tension of the synovial fluid in patients of the third group after 6 weeks after the end of the course of treatment increased by 11% relative to its value observed before treatment, in the second group - by 6%, while in patients of the first group the indicator remained practically unchanged, the increase is only 1, 6%. In patients of all groups in the synovial fluid, there is an increase in the concentration of phosphate ions and a decrease in the content of calcium ions compared to the level before treatment and, as a result, a decrease in the ratio. Analysis of the magnitude of positive changes and subjective pain sensations of patients and objective laboratory parameters using the three gonarthrosis therapy regimens studied in the work allows us to conclude the following. In the short term after the end of the course of treatment, namely, three weeks after the course of therapy, patients of all three groups noted the presence of positive dynamics in reducing the severity of pain, stiffness, and increasing the volume of painless passive movements in the knee joint. The average values of the severity of

the effects of therapeutic effects using questionnaires allow us to note that the greatest changes were found in patients of the third group who received complex treatment, including standard therapy in combination and intra-articular injections of AutoboTP and hyaluronic acid preparation. A good, although somewhat smaller effect was observed in patients in the group who received, in addition to standard therapy, injections of only AutoPRP [34.36].

There were practically no results of treatment in all treatment groups. Control studies performed six weeks after the end of the course of therapy made it possible to evaluate the dynamics of subjective pain sensations of patients and changes in the values of objective laboratory parameters of homeostatic parameters of blood, as well as synovial fluid. During this period of observation, statistically significant differences were revealed between the results of treatment in the groups of patients, indicating a significant leveling of the effects obtained in patients of the first group of the study and a slight decrease in the effects characteristic of the immediate terms of the examination after the end of the course of therapy in the second and third groups of patients. The long-term results of treatment, assessed six months after the end of the course of therapy in patients with gonarthrosis in terms of the severity of pain, indicate that by this time the effects achieved using only the standard treatment regimen have practically disappeared and are comparable to the level recorded before the start of treatment. course of therapy [13.14.37.38.39].

CONCLUSION. At the same time, by the 6th week, the intensity of the pain syndrome increased again, reaching, respectively, with the preservation of negative dynamics until the 24th week of observation ($p < 0.05$). The positive clinical effect of standard therapy on the relief of inflammation in the joint and the improvement of its function by 3 weeks after the end of therapy, modified treatment regimens, supplemented by intra-articular administration of autologous platelet-rich plasma and its combination with a hyaluronic acid preparation, by the 6th week, an increase in the viscosity of the synovial fluid to 17.25 ± 0.63 mPa s and 18.63 ± 0.87 mPa s; surface tension 49.16 ± 1.14 mN/m 50.96 ± 2.75 mN/m, respectively, while standard therapy slightly improves the viscosupplementary properties of the synovial fluid; the use of modified schemes provides a stable and prolonged decrease in the intensity of the pain syndrome up to 24 weeks of observation ($p < 0.05$). Methods of variance and correlation analysis revealed significant prognostic factors for the choice of therapy for patients with stage 2-3 gonarthrosis - clinical and functional parameters of the knee joint according to the WOMAC scale, the level of C-reactive protein in the blood, viscosity, surface tension and the ratio of Ca^{2+} / PO_4 ions 3- in synovial fluid.

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